



NASA Beacon

Dev/Enhancements Overview

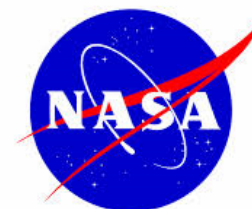
SAR Controllers Workshop 2024

March 19 – 21, 2024

Cody Kelly

NASA SAR Mission Office

National Affairs Manager



Agenda

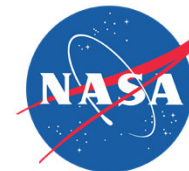


- NASA's Role in SAR
- Second-Gen Beacon Type Approval Process Progress
- SARSAT Support to Crewed Space Missions
- NASA's Role in Varied Space Programs (CCP, Artemis)

NASA's Role In SAR



- Innovate and develop new technologies to improve search and rescue hardware for national/international use in emergencies
 - Emergency beacons for use in distress
 - Ground stations that monitor and distribute data to rescue forces
 - Space payloads that detect the emergency signal and relay to Earth
- Technical arm for United States satellite-aided SAR Program (SARSAT)
- Represent USA on international level (COSPAS-SARSAT Program) with partner agencies (NOAA, USAF, USCG)
 - 42+ countries work together to obtain full Earth coverage of beacon detections and rescues
- Internal to NASA, the SAR Office supports NASA human spaceflight missions with technical expertise in SAR systems and future development





Second-Generation Beacon Type Approval Progress

- EPG is the only test facility in the world that is approved to test SGBs and SGB ELT(DT)s.
- At least one other test facility is expected to begin the application process to be able to provide SGB and SGB ELT(DT) testing services in 2024.
- Several U.S. Government SGB PLBs have completed testing:
 - NASA ANGEL, testing completed, C/S Letter of Compatibility application is in process
 - U.S. Army PRSS-1B, testing completed, C/S Letter of Compatibility received
 - In the Letters of Compatibility, C/S is restricting regular SGB beacons to non-operational use pending C/S declaration of system readiness for operational use of SGBs. The pacing items are MEOLUTs that are commissioned to receive and process SGB messages.
- At least one commercial SGB ELT(DT) is in development, but has not yet formally submitted a type approval application.
 - SGB ELT(DT)s would not have any restrictions on their use, as the worldwide detect-only coverage is already available.

SAR Controllers will begin to see alerts from SGBs and SGB ELT(DT)s.



SARSAT Support to Crewed Space Missions

- Commercial spaceflight sector is booming, with plans for orbital and suborbital crewed missions, some carrying SARSAT beacons
- NASA's Artemis Program aims to send astronauts to the moon at a yearly cadence, with unique global rescue considerations
- NASA working directly with SpaceX and Boeing under their Commercial Crew Program (CCP) contracts with NASA to ensure vehicle beacons meet SARSAT Letter of Compatibility standards
- Purely private missions will need to meet Type Approval standards for use, owing to international nature of spaceflight landing zones and private versus government use



SAR's Role in Orion Rescue & Recovery



Certified Orion's Sarsat Beacon



Evaluate Beacon Performance During Landing

Support Real-Time Orion Recovery Ops



Design & Integrate Astronaut Sarsat Beacons



Why Does this Matter to SAR Controllers?
SAR Controllers may respond to mixed ecosystem of SGB and FGB beacons in the foreseeable future. NASA use of SGB/FGB combinations exemplifies the type of SAR case where varied types may be used, and field testing shows full compatibility

SAR's Role in NASA-Sponsored Low-Earth Orbit Missions

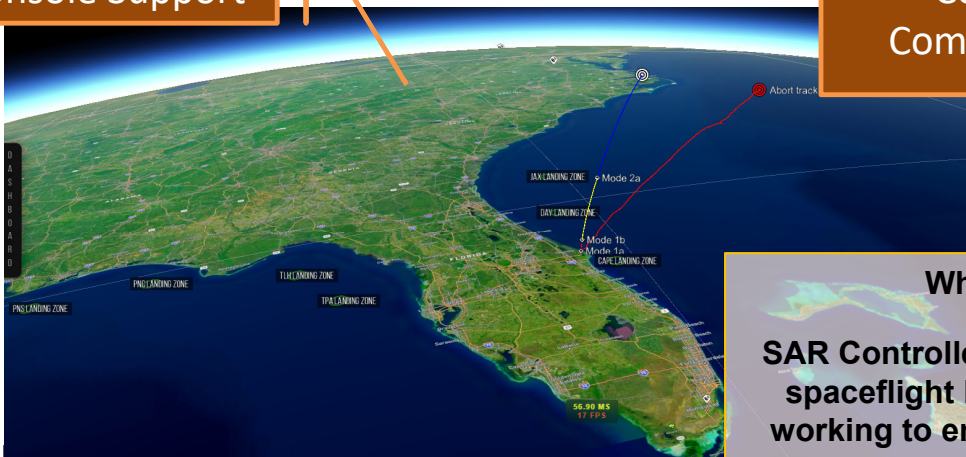


Expertise in Capsule SARSAT Beacon Certification



Education & Awareness of SARSAT Technical Consideration to Commercial Providers

Real-Time Console Support



Why Does this Matter to SAR Controllers?

SAR Controllers are the first line of response to highly dynamic spaceflight landing SAR events, and US SARSAT program is working to ensure that legacy interfaces are maintained in this new spaceflight era to ensure crew safety